REMARKS

The following remarks are being submitted as a full and complete response to the Office Action dated April 24, 2008. In view of the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1-8 and 10-12 stand for consideration in this application.

Prior Art Rejections

The First 35 U.S.C. §103(a) Rejection

Each of claims 1-8 and 11-12 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Kaise et al. (U.S. Pat. No. 6,483,495) in view of Taketomi et al. (U.S. Pat. No. 6,528,397). Applicants respectfully traverse this rejection for the reasons set forth below.

Claim 1

An image display device as recited in claim 1 has the following features: (1) active elements in each of a shift register, a digital-analog converter, and a buffer circuit use roughly-band-shaped-crystal silicon films having grain boundaries as channels of the active elements, and each of the grain boundaries is continuous in generally one direction, and the active elements in the shift register, the digital-analog converter, and the buffer circuit have a direction of movement of carriers therein in a direction of the grain boundaries, and (2) active elements in the sampling circuit use granular polysilicon films having loop-like grain boundaries as channels of the active elements. The feature (1) is for operating the active elements in a shift register, a digital-analog converter and a buffer circuit at a high speed. The feature (2) is for maintaining resistance of the active elements in a sampling circuit against a high voltage, because the active elements in the sampling circuit is not required to operate at a high speed but to with stand a high voltage.

As stated in the declaration submitted herewith, Applicants conducted experiments for comparing the properties of a thin film transistor employing a channel of a roughly-band-shaped-crystal silicon film and a thin film transistor employing a channel of a granular polysilicon film. Here, Applicants respectfully submit EXHIBITS 1 and 2 which show the results of the experiments. EXHIBIT 1 shows the relationship of a current degradation rate to

a stress voltage of a thin film transistor employing a channel of a roughly-band-shaped-crystal silicon film and to a thin film transistor employing a channel of a granular polysilicon film, respectively. As shown in EXHIBIT 1, the withstand voltage of the thin film transistor employing a channel of a roughly-band-shaped-crystal silicon film is lower than that of the thin film transistor employing a channel of a granular polysilicon film. EXHIBIT 2 shows the relationship of a power-supply-voltage to a delay time in operation of a thin film transistor employing a channel of a roughly-band-shaped-crystal silicon film and to a thin film transistor employing a channel of a granular polysilicon film, respectively. As shown in EXHIBIT 2, the delay time of the thin film transistor employing a channel of a roughly-band-shaped-crystal silicon film is shorter than that of the thin film transistor employing a channel of a granular polysilicon film. In other words, the thin film transistor employing a channel of a roughly-band-shaped-crystal silicon film operates at a higher speed than the thin film transistor employing a channel of a granular polysilicon film.

As shown in Fig. 9, for example, a block enclosed by a broken line includes a shift register, a digital-analog converter, and a buffer circuit. The block comprises thin film transistors formed of roughly-band-shaped-crystal silicon films having grain boundaries as channels of the active elements, and each of the grain boundaries is continuous in generally one direction, as recited in claim 1. Therefore, the shift registers digital-analog converter and the buffer circuit can operate at a high speed. On the other hand, a part including a sample circuit comprises thin film transistors formed of granular polysilicon films having loop-like grain boundaries as channels of the active elements, as recited in claim 1. Therefore, the sampling circuit does not operate at a high speed, but withstands a high voltage. As such, the features recited in claim 1 improve the performance and reliability of an image display device because each element in the image display device can operate as required.

The Examiner asserted that it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the active elements in the image display device of Kaise by using the polysilicon film transistor of Taketomi in order to allow the active elements of the image display device of Kaise to have high carrier mobility. Applicants respectfully disagree. It is not articulated why at the time the invention was made, one of ordinary skill in the art would have selectively used roughly-band-shaped-crystal silicon films having grain boundaries as channels of said active elements, each of the grain boundaries of the roughly-band-shaped-crystal silicon films being continuous in generally one direction to form active elements in each of said shift registers, said digital-analog

converter, and said buffer circuit, while selectively used granular polysilicon films having loop-like grain boundaries as channels of said active elements to form active elements in said sampling circuit. Indeed, neither Kaise nor Taketomi shows or suggests using two types of thin film transistors in a single image display device, namely, using thin film transistors each employing a channel of a roughly-band-shaped-crystal silicon film for a shift register, a digital-analog converter, and a buffer circuit while using thin film transistors each employing a channel of a granular polysilicon film for sampling circuits, considering the different properties of the two types of thin film transistors.

Therefore, at the time the invention was made, one of ordinary skill in the art could not and would not achieve all the features as recited in claim 1. Accordingly, claim 1 is not obvious in view of all the prior art cited.

Claims 2-8, 11-12

As to dependent claims 2-8 and 11-12, the arguments set forth above with respect to independent claim 1 are equally applicable here. The corresponding base claim being allowable, claims 2-8 and 11-12 must also be allowable.

The Second 35 U.S.C. §103(a) Rejection

Claim 10 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Kaise and Taketomi in view of Koma (U.S. Pat. No. 6,490,013). Applicants respectfully traverse this rejection for the reasons set forth below.

As set forth above, the combination of Kaise and Taketomi fails to teach all the elements recited in claim 1, from which claim 10 depends. The secondary reference of Koma fails to provide any disclosure, teaching or suggestion that makes up for the deficiencies in the combination of Kaise and Taketomi. Therefore, at the time the invention was made, one of ordinary skill in the art could not and would not achieve all the features as recited in claim 1, from which claim 10 depends. Accordingly, claim 10 is not obvious in view of all the prior art cited.

Conclusion

In light of the above Remarks, Applicants respectfully request early and favorable action with regard to the present application, and a Notice of Allowance for all pending claims is earnestly solicited.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and telephone number indicated below.

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